NMR Frequency Table

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Isotope		Spin	Nat. Abundance %	Receptivity		Larmor Frequencies for Various Field Strengths (T)								
				Natural rel. ^{13}C	Molar rel. ^{1}H	7.04925	9.39798	11.7467	14.0954	16.4442	17.6185	18.7929	19.9673	21.1416
1	H	1/2	99.9885	5.87E+03	**1.00E+00**	300.130	400.130	500.130	600.130	700.130	750.130	800.130	850.130	900.130
2	D	1	0.0115	6.52E-03	9.65E-03	46.072	61.422	76.773	92.124	107.474	115.150	122.825	130.500	138.175
3	T	1/2			1.21E+00	320.131	426.795	533.459	640.123	746.786	800.118	853.450	906.782	960.114
3	He	1/2	1.34E-04	3.48E-03	4.42E-01	228.637	304.817	380.996	457.176	533.355	571.445	609.535	647.624	685.714
6	Li	1	7.59	3.79E+00	8.50E-03	44.167	58.883	73.600	88.316	103.032	110.390	117.748	125.106	132.464
7	Li	3/2	92.41	1.59E+03	2.94E-01	116.642	155.506	194.370	233.233	272.097	291.529	310.961	330.393	349.825
9	Be	3/2	100.0	8.15E+01	1.39E-02	42.174	56.226	70.277	84.329	98.381	105.407	112.433	119.459	126.485
10	B	3	19.9	2.32E+01	1.99E-02	32.245	42.989	53.732	64.476	75.220	80.591	85.963	91.335	96.707
11	B	3/2	80.1	7.77E+02	1.65E-01	96.294	128.378	160.462	192.546	224.630	240.672	256.714	272.755	288.797
13	C	1/2	1.07	**1.00E+00**	1.59E-02	75.468	100.613	125.758	150.903	176.048	188.620	201.193	213.765	226.338
14	N	1	99.636	5.90E+00	1.01E-03	21.688	28.915	36.141	43.367	50.594	54.207	57.820	61.433	65.046
15	N	1/2	0.364	2.23E-02	1.04E-03	30.423	40.560	50.697	60.834	70.971	76.039	81.107	86.176	91.244
17	O	5/2	0.038	6.50E-02	2.91E-02	40.687	54.243	67.800	81.356	94.913	101.691	108.469	115.248	122.026
19	F	1/2	100.0	4.89E+03	8.32E-01	282.404	376.498	470.592	564.686	658.780	705.827	752.874	799.921	846.968
21	Ne	3/2	0.27	3.91E-02	2.46E-03	23.693	31.587	39.482	47.376	55.270	59.217	63.165	67.112	71.059
23	Na	3/2	100.0	5.45E+02	9.27E-02	79.390	105.842	132.294	158.746	185.198	198.424	211.650	224.876	238.101
25	Mg	5/2	10.00	1.58E+00	2.68E-03	18.373	24.494	30.616	36.738	42.859	45.920	48.981	52.042	55.103
27	Al	5/2	100.0	1.22E+03	2.07E-01	78.204	104.261	130.318	156.375	182.432	195.460	208.489	221.517	234.546
29	Si	1/2	4.685	2.16E+00	7.86E-03	59.627	79.495	99.362	119.229	139.096	149.030	158.963	168.897	178.831
31	P	1/2	100.0	3.91E+02	6.65E-02	121.495	161.976	202.456	242.937	283.418	303.658	323.899	344.139	364.379
33	S	3/2	0.75	1.00E-01	2.27E-03	23.038	30.714	38.390	46.066	53.742	57.580	61.418	65.256	69.094
35	Cl	3/2	75.76	2.10E+01	4.72E-03	29.406	39.204	49.002	58.800	68.598	73.497	78.396	83.295	88.194
37	Cl	3/2	24.24	3.88E+00	2.72E-03	24.478	32.634	40.789	48.945	57.101	61.179	65.256	69.334	73.412
39	K	3/2	93.258	2.79E+00	5.10E-04	14.005	18.672	23.338	28.004	32.671	35.004	37.337	39.670	42.003
41	K	3/2	6.730	3.34E-02	8.44E-05	7.687	10.249	12.810	15.371	17.932	19.213	20.494	21.774	23.055
43	Ca	7/2	0.135	5.10E-02	6.43E-03	20.199	26.929	33.659	40.389	47.119	50.484	53.849	57.214	60.579
45	Sc	7/2	100.0	1.78E+03	3.02E-01	72.907	97.199	121.490	145.782	170.074	182.220	194.366	206.511	218.657
47	Ti	5/2	7.44	9.18E-01	2.10E-03	16.920	22.557	28.195	33.833	39.470	42.289	45.108	47.926	50.745
49	Ti	7/2	5.41	1.20E+00	3.78E-03	16.924	22.563	28.203	33.842	39.481	42.300	45.120	47.939	50.759
50	V	6	0.250	8.18E-01	5.57E-02	29.924	39.894	49.865	59.835	69.805	74.790	79.775	84.761	89.746
51	V	7/2	99.750	2.25E+03	3.84E-01	78.943	105.246	131.549	157.852	184.155	197.306	210.458	223.609	236.761
53	Cr	3/2	9.501	5.07E-01	9.08E-04	16.965	22.617	28.270	33.922	39.575	42.401	45.227	48.054	50.880
55	Mn	5/2	100.0	1.05E+03	1.79E-01	74.400	99.189	123.978	148.768	173.557	185.951	198.346	210.741	223.135
57	Fe	1/2	2.119	4.25E-03	3.42E-05	9.718	12.955	16.193	19.431	22.669	24.288	25.906	27.525	29.144
59	Co	7/2	100.0	1.64E+03	2.78E-01	71.212	94.939	118.666	142.393	166.120	177.984	189.847	201.711	213.575
61	Ni	3/2	1.1399	2.40E-01	3.59E-03	26.820	35.756	44.692	53.628	62.564	67.032	71.500	75.968	80.436
63	Cu	3/2	69.15	3.82E+02	9.39E-02	79.581	106.096	132.612	159.127	185.643	198.901	212.158	225.416	238.674
65	Cu	3/2	30.85	2.08E+02	1.15E-01	85.248	113.652	142.055	170.459	198.863	213.065	227.266	241.468	255.670
67	Zn	5/2	4.102	6.92E-01	2.87E-03	18.779	25.035	31.292	37.549	43.806	46.934	50.063	53.191	56.319
69	Ga	3/2	60.108	2.46E+02	6.97E-02	72.035	96.037	120.038	144.039	168.041	180.041	192.042	204.043	216.043
71	Ga	3/2	39.892	3.35E+02	1.43E-01	91.530	122.026	152.523	183.020	213.517	228.765	244.013	259.262	274.510
73	Ge	9/2	7.76	6.44E-01	1.41E-03	10.469	13.958	17.446	20.934	24.423	26.167	27.911	29.655	31.399
75	As	3/2	100.0	1.49E+02	2.54E-02	51.390	68.513	85.635	102.758	119.881	128.442	137.003	145.564	154.126
77	Se	1/2	7.63	3.15E+00	7.03E-03	57.239	76.311	95.382	114.454	133.525	143.061	152.597	162.133	171.668
79	Br	3/2	50.69	2.37E+02	7.94E-02	75.195	100.248	125.302	150.356	175.410	187.937	200.464	212.991	225.518
81	Br	3/2	49.31	2.88E+02	9.95E-02	81.055	108.061	135.068	162.074	189.081	202.584	216.087	229.591	243.094
83	Kr	9/2	11.500	1.28E+00	1.90E-03	11.548	15.395	19.243	23.091	26.938	28.862	30.786	32.710	34.633
85	Rb	5/2	72.17	4.50E+01	1.06E-02	28.977	38.632	48.287	57.942	67.597	72.425	77.252	82.080	86.907
87	Rb	3/2	27.83	2.90E+02	1.77E-01	98.204	130.924	163.645	196.365	229.086	245.446	261.806	278.166	294.527
87	Sr	9/2	7.00	1.12E+00	2.72E-03	13.007	17.341	21.675	26.009	30.342	32.509	34.676	36.843	39.010
89	Y	1/2	100.0	7.00E-01	1.19E-04	14.707	19.607	24.507	29.408	34.308	36.758	39.208	41.658	44.108
91	Zr	5/2	11.22	6.26E+00	9.49E-03	27.901	37.197	46.494	55.790	65.086	69.734	74.382	79.031	83.679
93	Nb	9/2	100.0	2.87E+03	4.88E-01	73.460	97.936	122.413	146.889	171.365	183.603	195.841	208.079	220.317
95	Mo	5/2	15.90	3.06E+00	3.27E-03	19.559	26.076	32.593	39.110	45.627	48.885	52.144	55.402	58.661
97	Mo	5/2	9.56	1.96E+00	3.49E-03	19.970	26.623	33.277	39.931	46.585	49.911	53.238	56.565	59.892
99	Tc	9/2			3.82E-01	67.554	90.063	112.571	135.079	157.588	168.842	180.096	191.350	202.604
99	Ru	5/2	12.76	8.46E-01	1.13E-03	13.821	18.427	23.032	27.637	32.242	34.545	36.847	39.150	41.452
101	Ru	5/2	17.06	1.58E+00	1.57E-03	15.491	20.652	25.814	30.975	36.136	38.717	41.298	43.878	46.459

Isotope		Spin	Nat. Abundance %	Receptivity		Larmor Frequencies for Various Field Strengths (T)								
				Natural rel. ^{13}C	Molar rel. ^{1}H	7.04925	9.39798	11.7467	14.0954	16.4442	17.6185	18.7929	19.9673	21.1416
103	Rh	1/2	100.0	1.86E-01	3.17E-05	9.563	12.750	15.936	19.123	22.309	23.902	25.496	27.089	28.682
105	Pd	5/2	22.33	1.49E+00	1.13E-03	13.734	18.310	22.886	27.463	32.039	34.327	36.615	38.903	41.191
107	Ag	1/2	51.839	2.05E-01	6.74E-05	12.149	16.197	20.244	24.292	28.340	30.364	32.388	34.412	36.436
109	Ag	1/2	48.161	2.90E-01	1.02E-04	13.967	18.620	23.274	27.927	32.581	34.908	37.234	39.561	41.888
111	Cd	1/2	12.80	7.27E+00	9.66E-03	63.674	84.890	106.105	127.320	148.536	159.144	169.751	180.359	190.967
113	Cd	1/2	12.22	7.94E+00	1.11E-02	66.608	88.802	110.995	133.188	155.381	166.478	177.574	188.671	199.767
113	In	9/2	4.29	8.85E+01	3.51E-01	65.626	87.491	109.357	131.223	153.089	164.022	174.954	185.887	196.820
115	In	9/2	95.71	1.99E+03	3.53E-01	65.766	87.679	109.592	131.504	153.417	164.373	175.330	186.286	197.242
115	Sn	1/2	0.34	7.11E-01	3.56E-02	98.199	130.918	163.636	196.355	229.074	245.433	261.793	278.152	294.511
117	Sn	1/2	7.68	2.08E+01	4.60E-02	106.943	142.575	178.208	213.840	249.472	267.288	285.104	302.921	320.737
119	Sn	1/2	8.59	2.66E+01	5.27E-02	111.920	149.211	186.502	223.792	261.083	279.728	298.374	317.019	335.664
121	Sb	5/2	57.21	5.48E+02	1.63E-01	71.823	95.753	119.684	143.615	167.545	179.510	191.476	203.441	215.406
123	Sb	7/2	42.79	1.17E+02	4.66E-02	38.894	51.854	64.813	77.772	90.731	97.211	103.691	110.170	116.650
123	Te	1/2	0.89	9.61E-01	1.84E-02	78.543	104.713	130.883	157.052	183.222	196.307	209.392	222.477	235.562
125	Te	1/2	7.07	1.34E+01	3.22E-02	94.690	126.240	157.790	189.340	220.889	236.664	252.439	268.214	283.989
127	I	5/2	100.0	5.60E+02	9.54E-02	60.048	80.056	100.063	120.071	140.078	150.082	160.086	170.090	180.093
129	Xe	1/2	26.4006	3.35E+01	2.16E-02	83.467	111.277	139.087	166.897	194.707	208.613	222.518	236.423	250.328
131	Xe	3/2	21.2324	3.51E+00	2.82E-03	24.742	32.986	41.230	49.474	57.718	61.840	65.962	70.084	74.206
133	Cs	7/2	100.0	2.84E+02	4.84E-02	39.365	52.482	65.598	78.714	91.830	98.388	104.946	111.504	118.062
135	Ba	3/2	6.592	1.94E+00	5.01E-03	29.816	39.751	49.685	59.620	69.554	74.521	79.489	84.456	89.423
137	Ba	3/2	11.232	4.62E+00	7.00E-03	33.353	44.466	55.579	66.692	77.805	83.361	88.918	94.474	100.031
138	La	5	0.090	4.97E-01	9.40E-02	39.600	52.794	65.989	79.183	92.377	98.974	105.572	112.169	118.766
139	La	7/2	99.910	3.56E+02	6.06E-02	42.395	56.521	70.647	84.772	98.898	105.961	113.023	120.086	127.149
141	Pr	5/2	100.0	1.97E+03	3.35E-01	91.89	122.51	153.12	183.74	214.36	229.67	244.97	260.28	275.59
143	Nd	7/2	12.2	2.43E+00	3.39E-03	16.35	21.80	27.25	32.69	38.14	40.86	43.59	46.31	49.04
145	Nd	7/2	8.3	3.87E-01	7.93E-04	10.07	13.43	16.78	20.14	23.49	25.17	26.85	28.53	30.20
147	Sm	7/2	14.99	1.34E+00	1.52E-03	12.51	16.68	20.84	25.01	29.18	31.26	33.35	35.43	37.52
149	Sm	7/2	13.82	6.92E-01	8.52E-04	10.31	13.75	17.18	20.62	24.06	25.77	27.49	29.21	30.93
151	Eu	5/2	47.81	5.04E+02	1.79E-01	74.62	99.48	124.34	149.20	174.06	186.49	198.92	211.35	223.78
153	Eu	5/2	52.19	4.73E+01	1.54E-02	32.94	43.91	54.88	65.86	76.83	82.32	87.80	93.29	98.78
155	Gd	3/2	14.80	1.26E-01	1.45E-04	9.21	12.28	15.35	18.42	21.49	23.03	24.56	26.10	27.63
157	Gd	3/2	15.65	3.00E-01	3.26E-04	12.08	16.11	20.13	24.16	28.19	30.20	32.21	34.22	36.24
159	Tb	3/2	100.0	4.08E+02	6.94E-02	72.14	96.18	120.22	144.26	168.29	180.31	192.33	204.35	216.37
161	Dy	5/2	18.889	5.26E-01	4.74E-04	10.32	13.75	17.19	20.63	24.07	25.78	27.50	29.22	30.94
163	Dy	5/2	24.896	1.91E+00	1.31E-03	14.46	19.28	24.10	28.92	33.74	36.15	38.56	40.97	43.38
165	Ho	7/2	100.0	1.16E+03	1.98E-01	63.43	84.57	105.71	126.84	147.98	158.54	169.11	179.68	190.25
167	Er	7/2	22.869	6.77E-01	5.04E-04	8.66	11.54	14.42	17.31	20.19	21.63	23.08	24.52	25.96
169	Tm	1/2	100.0	3.32E+00	5.66E-04	24.82	33.10	41.37	49.64	57.91	62.04	66.18	70.32	74.45
171	Yb	1/2	14.28	4.63E+00	5.52E-03	52.521	70.020	87.519	105.019	122.518	131.268	140.017	148.767	157.517
173	Yb	5/2	16.13	1.28E+00	1.35E-03	14.61	19.48	24.35	29.22	34.09	36.52	38.96	41.39	43.83
175	Lu	7/2	97.41	1.79E+02	3.13E-02	34.27	45.69	57.11	68.53	79.94	85.65	91.36	97.07	102.78
176	Lu	7	2.59	6.05E+00	3.98E-02	24.33	32.43	40.53	48.64	56.74	60.80	64.85	68.90	72.95
177	Hf	7/2	18.60	1.53E+00	1.40E-03	12.18	16.24	20.30	24.36	28.42	30.45	32.48	34.51	36.53
179	Hf	9/2	13.62	4.38E-01	5.47E-04	7.65	10.20	12.75	15.30	17.85	19.13	20.40	21.68	22.95
181	Ta	7/2	99.988	2.20E+02	3.74E-02	35.984	47.974	59.964	71.953	83.943	89.938	95.932	101.927	107.922
183	W	1/2	14.31	6.31E-02	7.50E-05	12.505	16.671	20.837	25.004	29.170	31.253	33.337	35.420	37.503
185	Re	5/2	37.40	3.05E+02	1.39E-01	67.603	90.128	112.652	135.177	157.701	168.964	180.226	191.488	202.751
187	Re	5/2	62.60	5.26E+02	1.43E-01	68.284	91.036	113.788	136.539	159.291	170.667	182.042	193.418	204.794
187	Os	1/2	1.96	1.43E-03	1.24E-05	6.850	9.132	11.415	13.697	15.979	17.120	18.262	19.403	20.544
189	Os	3/2	16.15	2.32E+00	2.44E-03	23.306	31.072	38.837	46.602	54.368	58.251	62.133	66.016	69.899
191	Ir	3/2	37.3	6.38E-02	2.91E-05	5.40	7.20	9.00	10.79	12.59	13.49	14.39	15.29	16.19
193	Ir	3/2	62.7	1.37E-01	3.73E-05	5.86	7.82	9.77	11.73	13.68	14.66	15.63	16.61	17.59
195	Pt	1/2	33.832	2.07E+01	1.04E-02	64.518	86.015	107.512	129.009	150.505	161.254	172.002	182.751	193.499
197	Au	3/2	100.0	1.62E-01	2.76E-05	5.31	7.08	8.84	10.61	12.38	13.26	14.15	15.03	15.92
199	Hg	1/2	16.87	5.89E+00	5.94E-03	53.756	71.667	89.577	107.488	125.399	134.354	143.310	152.265	161.221
201	Hg	3/2	13.18	1.16E+00	1.49E-03	19.843	26.455	33.067	39.678	46.290	49.595	52.901	56.207	59.513
203	Tl	1/2	29.52	3.40E+02	1.96E-01	171.444	228.567	285.690	342.813	399.937	428.498	457.060	485.621	514.183
205	Tl	1/2	70.48	8.36E+02	2.02E-01	173.127	230.810	288.494	346.178	403.862	432.704	461.546	490.388	519.230
207	Pb	1/2	22.1	1.18E+01	9.06E-03	62.789	83.710	104.630	125.551	146.471	156.932	167.392	177.852	188.313
209	Bi	9/2	100.0	8.48E+02	1.44E-01	48.229	64.298	80.367	96.437	112.506	120.541	128.575	136.610	144.644
209	Po	1/2			1.44E-02	73.08	97.42	121.77	146.12	170.47	182.64	194.81	206.99	219.16
231	Pa	3/2	100.0	4.06E+02	6.90E-02	72.00	95.99	119.98	143.97	167.96	179.96	191.95	203.94	215.94
235	U	7/2	0.7204	6.53E-03	1.54E-04	5.527	7.368	9.209	11.051	12.892	13.813	14.734	15.654	16.575

Freq. to 3 dec. places are experimental for IUPAC Standards (2001); freq. to 2 dec. are calculated from magnetic moments; abundances (2003) are representative terrestrial values determined to number of decimal places given.

BRUKER BIOSPIN

The Pulse of Innovation